

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

1. (currently amended) A tactile feedback apparatus for a cursor control device comprising:
a cursor control mechanism having a shaft, the shaft having a top and a bottom;
5 a piezo-electric material mounted on a semi-rigid substrate;
the substrate coupled to the bottom of the shaft cursor control mechanism; and
a control circuit electrically interconnected to the piezo-electric material for providing a signal to
cause the piezo-electric material to vibrate;
the cursor control mechanism providing a z-axis output signal in response to being actuated by an
10 operator;
the control circuit sensing the z-axis output signal and providing a control signal to cause the
piezo-electric material to vibrate in response to the z-axis output signal; and
the piezo-electric material adapted to vibrate for a pre-determined period of time.
- 15 2. (canceled).

3. (currently amended) The tactile feedback apparatus of claim 1 and wherein:
the semi-rigid material is a thin layer of metal the substrate is coupled to the bottom of the shaft
by a plurality of standoffs.

4. (currently amended) The tactile feedback apparatus of claim 1 and wherein:

~~the semi-rigid material is an alumina material the cursor control mechanism has a cavity, the substrate mounted in the cavity.~~

5 5. (original) The tactile feedback apparatus of claim 1 and wherein:

the semi-rigid material comprises an additional piezo-electric wafer.

6. (original) The tactile feedback apparatus of claim 1 and wherein:

the semi-rigid material comprises a ceramic material.

10

7. (original) The tactile feedback apparatus of claim 1 and further comprising:

an indicating circuit for providing an indicating signal when the cursor is placed over a predefined position on a display; and

15 the control circuit providing the control signal to cause the piezo-electric material to vibrate in response to the indicating signal.

8. (original) The tactile feedback apparatus of claim 4 and wherein

the indicating circuit for providing an indicating signal is active when the cursor is placed over an active area on the display.

20

9. (original) The tactile feedback apparatus of claim 1 and wherein the piezo-electric material comprises a plurality of layers of piezo-electric material.

10. (previously amended) A computer input system comprising:

a computer;

a cursor control device electrically interconnected to the computer;

software for determining a cursor position based upon user actuation of the cursor control device;

5 the cursor control device further comprising:

an x-, y-, and z-axis sensor system;

a piezo-electric material mounted to a semi-rigid material and mechanically coupled to the cursor control device;

an electric circuit for generating a predefined signal;

10 an electrical interconnection between the computer and the piezo-electric material, the piezo-electric material being formed to vibrate upon activation by the predefined electrical signal;

the piezo-electric material providing tactile feedback to the user when activated by the predefined electrical signal;

15 the software determining a condition requiring tactile feedback and providing the predefined electrical signal to the piezo-electric material in the cursor control device; and the software further adapted to cause the piezo-electric material to vibrate for a predetermined period of time.

20 11. (previously amended) The computer input system of claim 10 and further comprising: the predefined electrical signal is an ac signal.

12. (previously amended) The computer input system of claim 11 and wherein the ac signal is at least 20 volts peak to peak with a frequency of at least 300 Hz.

13-14. (canceled).

5

15. (previously amended) The computer input system of claim 10 and wherein the cursor control device is a pointing stick.

16. (previously amended) The computer input system of claim 10 and wherein the cursor control
10 device is a mouse.

17. (canceled).

18. (currently amended) A tactile feedback for a cursor control device comprising:

a cursor control device for providing a desired cursor movement, the cursor control device having a top and bottom, the top of the cursor control device adapted to be touched by a user;

a piezo-electric assembly operable as a source of vibrations;

5 a control device for sensing a predefined condition and providing an electrical signal to activate the piezo-electric assembly; and wherein the piezo-electric assembly is mechanically coupled to the bottom of the cursor control device to deliver the vibrations to a the user; and

an input suppression module coupled to the cursor control device, the input suppression module adapted to deactivate the cursor control device for a pre-determined period of time in response to

10 detecting the electrical signal generated by the control device .

19. (currently amended) A method for providing a tactile feedback comprising the following steps:

providing a cursor control device having a top and a bottom;

15 providing a piezo-electric assembly that vibrates upon electrical activation;

mounting the piezo-electric assembly to the bottom of the cursor control device to provide a mechanical transfer of vibrations from the piezo-electric assembly to the cursor control device;

sensing a predefined condition for which tactile feedback is desired;

disabling the cursor control device when the predefined condition is sensed;

20 activating the piezo-electric assembly to provide mechanical vibrations to the cursor control device for a predetermined period of time; and

enabling the cursor control device after the predetermined period of time.